

ALEUTIAN ISLANDS AND ATKA-AMLIA ISLANDS MANAGEMENT AREAS
SALMON MANAGEMENT REPORT, 1997

By
Patrick B. Holmes

Regional Information Report¹ No. 4K98-3

Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
211 Mission Road
Kodiak, Alaska 99615

February 1998

¹The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished division reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Commercial Fisheries Management and Development Division.

AUTHOR

Patrick B. Holmes is the Aleutian Islands Salmon Biologist, Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, 211 Mission Road, Kodiak, Alaska 99615.

ACKNOWLEDGMENTS

The Dutch Harbor shellfish staff were very helpful in issuing salmon subsistence permits and assisting in stream surveys. Kathleen Herring distributed permits, answered questions from the public and advised the author on subsistence developments. Susan Engle notified permit holders to make their annual reports, collected and organized the subsistence harvest information. Betsy Wilson assisted phone interviews of persons who had not reported on time. George Pappas, Mike Ruccio, and Charlie Stock assisted on foot surveys and logistics. George Papas and Mike Ruccio also assisted in checking subsistence permit reporting, boat maintenance, logistics, surveys and stream marker placement. The Dutch Harbor/ Unalaska Fish and Game Advisory Committee's advice on subsistence and salmon resource issues is appreciated.

TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	i
LIST OF FIGURES	ii
INTRODUCTION	1
1997 SEASON	2
Commercial Harvest.....	2
Subsistence and Personal Use Harvest.....	3
Escapements	4
Unalaska Salmon Resource Issues	5
1998 OUTLOOK.....	8
LITERATURE CITED	10
TABLES	12
FIGURES	24

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Aleutian Islands Area, (excluding Atka and Amliia Islands) commercial salmon catches (in numbers of fish), 1911-1997	12
2. Atka-Amliia Islands Area commercial salmon catches (in numbers of fish), 1992-1997.....	14
3. Emergency orders for Aleutian Islands Area, 1997.....	15
4. Estimated subsistence harvest by gear type for the community of Atka, 1994.....	16
5. Estimated subsistence salmon harvest for Unalaska Island, 1985-1997	17
6. Average subsistence salmon harvest, in number of fish, per successful permit holder, Unalaska Island, 1987-1997.	18
7. Adak-Kagalaska Islands estimated personal use catch, 1988-1997.	19
8. Unalaska Island salmon escapements, 1997.....	20
9. Unalaska Bay Section sockeye salmon escapement goals	22
10. Unalaska Bay Section pink salmon escapement goals	23

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Map of the Aleutian Islands, Atka-Amlia Islands, and Alaska Peninsula Areas.....	24
2. Map of the Aleutian Islands Management Area from Unimak Island to Umnak Island with the statistical salmon fishing areas shown	25
3. Unalaska Lake outlet revised subsistence salmon closed water markers.....	26
4. Unalaska Bay subsistence salmon closed waters for 1997.....	27
5. Proposed closed waters for the outlet of McLees Lake.....	28

INTRODUCTION

This report presents salmon harvest and limited escapement information on the Aleutian Islands and Atka-Amlia Islands Management Areas.

The Aleutian Islands Management Area consists of the Aleutian Islands west of Unimak Island, excluding the Atka-Amlia Islands Management Area which encompass all Aleutian Islands waters located between Segum Pass (172°50' W. long.) and Atka Pass (175°23' W. long.) (Figures 1 and 2; ADF&G, 1995a).

The Aleutian Islands Area is part of salmon permit Area M. Seining is the only legal method to harvest salmon in the Aleutian Islands Area. Legal harvest methods for Atka-Amlia Islands, Area F, includes both set gillnet gear and purse seines. To date, only set gillnet fishermen have reported harvest from Atka-Amlia Islands Area (Holmes 1995).

The Aleutian Islands produce runs of sockeye, coho, pink, and chum salmon. However, only pink salmon have proven to be of commercial importance (Table 1). Unalaska, Umnak, Unimak, Atka, Amlia, Adak, and Attu Islands produce commercial sized pink salmon runs during some years. Tanaga, Kanaga, and Kiska Islands all have at least one important pink salmon stream.

Nearly all commercial fishing effort has been confined to Unalaska Island, except for occasional fishing on Umnak Island during the 1950s and early 1960s, and a 1963 Attu Island expedition. The Atka/Amlia fishery has yet to be a commercial success. Only small numbers of pink salmon have been landed at Atka Island in 1992, 1993, and 1994 (Table 2; Holmes 1995).

Aleutian Islands pink salmon runs tend to be much larger during even years. Often there is no commercial harvest during odd years. The record Aleutian pink salmon catch of nearly 2.6 million fish was taken near Unalaska Island in 1980 (Table 1). Approximately two million fish were caught in Makushin Bay that year. Nateekin River in Unalaska Bay historically produced large runs during both odd and even years, but hasn't produced a strong odd year run since 1981. Pink salmon runs are often unstable, producing very high returns and then collapsing for no apparent reason; stream scouring from violent storms and variations in marine survival are suspected factors.

Historical salmon harvests for the Aleutian Islands and Atka-Amlia Islands Areas are reported in Tables 1 and 2. The average even year pink salmon for 1984-1994 catch is about 700,000 fish; the odd year average pink harvest for 1985-1995 is around 1,000 fish (Table 1).

Unalaska salmon escapement data are incomplete for most years due to poor weather, remoteness, lack of availability of suitable aircraft, and high cost of aircraft charters. Escapement information is nearly nonexistent for the balance of the Aleutian Islands Area. The only comprehensive escapement and distribution study of the entire Aleutian chain was done by ADF&G in 1982 (Holmes 1997a). Limited studies have also been conducted at Amchitka Island in 1977 (Seimenstad 1977; Valdez 1977); ADF&G did repetitive surveys on Atka and Amlia Islands in 1992, 1993, and 1994 (Holmes 1995); the U.S. Fish and Wildlife Service (USFWS)

did additional abundance and distribution research at Adak Island in 1993 and 1994 (Palmer 1995)

The timing of Unalaska pink salmon runs is similar to the South Peninsula, while Adak and Atka-Amlia pink salmon run timing may be one to two weeks later. Aleutian Island pink salmon time of entry varies considerably between years and between streams; it is much more variable than on the South Peninsula. Pink salmon often begin to enter streams in late July and may trickle in throughout September at both Atka and Unalaska Islands during large runs (usually even years). Observations by USFWS indicate a similar pattern at Adak Island.

Aleutian pink and sockeye salmon (within a given age group) tend to be of smaller size and weight than those of Alaska Peninsula stocks (Shaul and Berceli 1994).

Markets are often a limiting factor of commercial salmon production in the Aleutian Islands. This has been true for both Unalaska Island and the Atka-Amlia Island fisheries. At Unalaska there is often no market unless pink salmon abundance warrants tenders traveling from King Cove or a small floating processor moves into the area. Some fish (usually sockeye salmon) were salted by local fishermen prior to 1979. Processors located at Unalaska-Dutch Harbor or Akutan, purchased most of the salmon from 1979 through 1988. Due to the decline in demand for frozen pink salmon during recent years, most of the harvest has been transported to the Alaska Peninsula for canning. The lack of market for pink salmon has also been the major factor affecting harvest in the Atka-Amlia Islands Area.

1997 SEASON

The commercial salmon fishery was managed by the Alaska Department of Fish and Game staff in Cold Bay. During 1995 and 1996 a salmon biologist was stationed in Dutch Harbor to assist in managing the local fishery and monitor escapements. This individual also assisted with the Dutch Harbor food and bait herring fishery, monitored the commercial fisheries at Atka and Unalaska Islands, as well as the Unalaska sport and subsistence fisheries and habitat issues. Budget reductions forced the closure of this program. Salmon subsistence permits were issued and harvest reports compiled in Dutch Harbor. Harvest data were summarized by the salmon staff, based in Kodiak during the winter.

Commercial Harvest

The Aleutian Islands remain the State's smallest and least productive salmon fishery. For the third year in a row there were no commercial landings at Unalaska or Atka Islands. As in most odd years there was no commercial fishery.

The commercial season opened by regulation at both Unalaska and Atka-Amlia Islands; however local fishermen chose to participate in other, more lucrative salmon or halibut fisheries (Table 3).

While 126 Area M seine permit holders could have fished in the Aleutian fisheries, none did. Only seven local Atka-Amlia fishermen obtained permits and none chose to fish salmon.

There was one commercial salmon emergency order (EO) to expand the closed waters at the mouth of the Iliuliuk River, outlet to Unalaska Lake. The sockeye escapement into this lake has been very poor for many years and it has not met its escapement goal since 1987 (Holmes 1997). This action moved the southern marker approximately 300 yards south of the bridge. The closure was implemented to provide greater protection for the later sockeye salmon that school up in the narrow part of the channel near the old marker under the bridge, when the commercial pink fishery opens.

Subsistence and Personal Use Harvest

Subsistence salmon harvests are very important to the communities of Unalaska and Atka. (Tables 4,5, and 6; Veltre and Veltre, 1982, 1983, L. Scarborough, ADF&G Anchorage, personal communication). Salmon personal use information for the former military community of Adak is presented in Table 7. Sockeye salmon are the most desired species in Aleutian Island communities.

The number of sockeye salmon taken and the number of harvesters at Unalaska Island has increased considerably in recent years. Between 1994 and 1995 the estimated sockeye harvest increased by 61%, to 4,484 fish. While the number of permits increased to 189 in 1996 the subsistence harvest fell nearly 75% in 1996, to a five year low of 1,107 sockeye. Most of the sockeye catch in recent years has been taken at Reese Bay (McLee's Lake). Over 85% (968 fish) of the 1996 subsistence sockeye catch were taken at McLee's Lake. In 1997, 221 subsistence permits were issued and 163 were returned (reported). The total Unalaska Island sockeye salmon harvest was estimated to be 4,192 fish of which 3,945 (94%) were caught at Reese Bay.

Most of the subsistence fishing effort that usually targeted on Unalaska Lake sockeye salmon shifted to McLee's Lake this season due to the subsistence restrictions implemented this season and community support. The subsistence regulations were successfully implemented thanks to the support the local Fish and Game Advisory Committee and the community of Unalaska's desire to improve the escapement into Unalaska Lake.

The estimated subsistence sockeye harvest from Unalaska Lake was only a small portion of the Island's overall subsistence catch, 36 fish (less than 1 % of the total island catch) in 1997. Unalaska Lake sockeye are extremely important to local residents who cannot travel to other places to catch sockeye salmon. All but three of the subsistence permit holders this year were local residents (Table 5). A total of 148 coho or about 17% of the Island's coho catch were taken at Nateekin River this season. While rod and reel is not a legal gear for harvesting subsistence salmon many local residents use this gear type (and State daily bag limits) to harvest what they consider their subsistence salmon (L. Scarborough, ADF&G, Anchorage personal communication). Residents who cannot afford gillnets, and don't have access to them, fish with rod and reel in salt water along the road system in Summers Bay, Humpy and Morris Coves as well as both salt water and freshwater in the Shaisnikof River. Sockeye are taken at Summers

Bay and Morris Cove, coho are taken at the previous locations and at Summers Bay and Shaisnikof, while pinks are caught at all systems.

Atka subsistence data were collected by interviews conducted by ADF&G Subsistence Division; due to budget reductions the last survey was in 1994. The subsistence harvest levels and fishing methods have remained relatively stable at the small (pop. 80-90) community of Atka; with a catch of 400-500 sockeye and a total harvest of around 2,500 salmon. Harvest varies slightly with changes in population and salmon run strength.

Personal use harvest at Adak declined from the 1988-93 average of 449 sockeye salmon per year to 0 in 1994, with only 91 fish in 1996 and a preliminary (12 out of 18 permits returned) estimate of 229 sockeye salmon for 1997 (Table 7). Most of the fish (75%) were taken this year at Quail Bay on Kagalaska Island. Participants in this fishery have greatly decreased since 1993 due to the closing of the U.S. Navy Base at Adak. An increasing number of resident Alaskans are moving to Adak from other villages in the Aleutians, Pribilofs and the Alaska mainland. Presently 300 civilians presently work and live at Adak. Civilian families are starting to move to the Island, and the population is expected to reach 400 next summer. It is expected that the former military base will be transferred to private ownership this year. As the facility develops as a fisheries support center the population is expected to increase. Persons living at Adak will probably seek to participate in a subsistence salmon fishery. Presently salmon harvest at Adak is managed by ADF&G staff in Cold Bay using personal use permits.

Escapements

The 1997 pink salmon escapements into many Unalaska streams were near or slightly above expectations for an odd year (Table 8). Pink salmon escapements for most streams have been low the last two years because of stream scouring and changes in marine survival. Sockeye peak escapement counts into Unalaska Lake improved slightly from 255 fish in 1996 to 330 fish in 1997. A survey of spawners slightly over two weeks after the peak count observed 200 fish. While sockeye escapement improved slightly they still continued to fall below the minimum peak escapement level of 400 fish. Sockeye escapements into Mclee's Lake were at a record high of 11,000 fish.

Coho salmon escapement to Nateekin River of 576 fish this year was a slight improvement over the 447 fish peak count in 1996 but is still lower than the 1994 survey of just over 1,400 fish. A definitive escapement goal for coho has not been developed for Nateekin River because of a lack of adequate stream survey data. Some long term residents of the community of Unalaska believe that escapements have been declining in this stream for at least the last 5 years (Walter Dyakanoff, Unalaska, personal communication). Department staff familiar with the Aleutians and the Alaska Peninsula believe that the escapement the last two years is less than desirable for a river of this size. Based on observations of other streams, biologists believe that this system should have an escapement of at least 1,000 to 1,500 coho by the middle of October. If escapements continue to drop or not improve then more restrictive regulations are in order.

A lack of funding has prevented the research for development of escapement goals for all salmon species and streams on Unalaska Island. Area biologists have developed desired peak escapement levels for sockeye and pink salmon for key index streams based on experience with other systems on the Alaska Peninsula (A. Shaul, ADF&G, Cold Bay personal communication; Tables 9 and 10)

Escapement survey effort at Unalaska Island has been less than desired. The lack of a salmon biologist stationed at Dutch Harbor to take advantage of infrequent good weather periods, a shortage of available aircraft, and frequent bad weather severely limited the department's ability to assess salmon escapements.

No stream surveys were conducted at Atka or Amlia Islands in 1997 due to a lack of funds for surveys. Local Atka residents reported a small return of pink salmon to local streams in 1997. Atka-Amlia Islands escapement information for 1992, 1993, and 1994 is presented in Holmes, 1995.

Unalaska Salmon Resource Issues

Subsistence management issues at Unalaska include: 1) Sockeye escapement into Unalaska Lake continues to fall short of the minimum escapement goal. 2) Low coho escapements into Nateekin River in 1996 and 1997. 3) Possible under reporting of subsistence harvest. 4) Loss of salmon due to leaving subsistence nets unattended. 5) McLee's Lake harvest patterns. These issues lead to discussions with members of the local Fish and Game Advisory Committee and implementation of subsistence restrictions for Unalaska Bay for the 1997 season by emergency order and by stipulations on the subsistence permit.

The community of Dutch Harbor/Unalaska has changed dramatically in the last 30 years. It has grown from a small native village of around 450 people to become a multi-cultural city of over 4,000 people; most of whom have moved there from outside of Alaska. While little data exists there is substantial anecdotal information to establish that the subsistence and sport harvest levels have increased substantially (E. Berekof, Unalaska Advisory Committee, Unalaska, personal communication). Many people who cannot afford boats and gillnet gear use rod and reel to obtain their subsistence salmon (L. Scarborough, ADF&G, Anchorage, personal communication). Presently subsistence and sport users harvest all of the salmon; there was no commercial harvest during the last three years. When compared to "mainland" salmon systems Unalaska's salmon runs are rather small and easily over exploited.

The majority of the sockeye salmon harvest is taken in the local subsistence fishery. A few sockeye are taken in the sport fishery but there is little quantifiable data as to actual catch (L. Schwarz, ADF&G, Kodiak, personal communication). Since the mid 1980s there has been no significant commercial salmon harvest in Unalaska Bay; that fishery focused on pink salmon, not the more desirable subsistence species of sockeye and coho salmon.

Unalaska Lake has not reached its minimal escapement goal (400 sockeye salmon) since 1987, peak escapements in 1995 and 1996 were about 250 fish. There have been severe environmental

degradation of this lake and its drainages since World War II. Most of the habitat damage has been caused by siltation of the lake and loss of spawning grounds for lake shore spawners. A small stock of stream-spawning sockeye salmon using the lake's inlet stream have been virtually nonexistent since a major flood in the mid-1980s scoured the stream; other factors of continued habitat degradation and possible overharvest may also be factors preventing the re-establishment of this stock. The City of Unalaska has helped toward restoration of the lake by paving some of the roadway above the lake and installing silt traps to reduce the flow of silt into the lake. The local Fish and Game Advisory Committee has asked ADF&G for assistance in developing an active program to rehabilitate the lake and improve sockeye and coho productivity in this system including re-establishment of the stream spawning stock of sockeye salmon. Unfortunately budget reductions have prevented the department from taking a leading role in that effort.

Until this year, the majority of Unalaska Lake sockeye salmon were taken in the subsistence fishery at the south marker underneath the Unalaska Bridge (Figure 3). The few fish returning to the lake are easily caught at this location as most of the fish travel through this bottleneck located at the narrows in the Illiuliuk Channel to enter the lake. Nearly 75% of the Unalaska Lake subsistence catch was taken at this spot in 1996, most of the stream's coho salmon are also taken here. In addition, the Unalaska Harbor Master had identified fishing in the narrow channel at the bridge as being a hazard to navigation. This problem was addressed in season, by emergency order.

Many of the salmon streams in Unalaska Bay have not achieved desired escapement levels in recent years. In addition to Unalaska Lake sockeye escapement falling short the Nateekin River had a low escapement of coho last year. Previous to this year fishermen were allowed to fish in the mouth of many streams, as long as no more than half the mouth was blocked. Establishing 250 yard subsistence closed waters for Nateekin River and other systems in Unalaska Bay should help to improve escapements into local streams.

In 1996, streams from Unalaska Lake north to Morris Cove had 500 yard closed water markers at their salt water terminus (Figure 4; ADF&G, 1995b). Streams in Captain's, Nateekin and Broad Bays had no marine closed water markers at the stream mouths. A lack of closed waters at stream outlets allowed nets to be fished in the stream mouths (as long as no more than 1/2 of the mouth was not obstructed). This practice may have resulted in large numbers of fish being caught at one time potentially jeopardizing the stream's spawning potential. A substantial number of coho salmon were also harvested in the subsistence fishery near the bridge and while escapement data is lacking, the Unalaska Lake coho run is not believed to be as large as it could be. This problem was addressed in season during 1997, with the support of the local Fish and Game Advisory Committee; 250 yard closed water restrictions were implemented by emergency order.

Prior to this season it was suspected that as much as one third to one half of the salmon catch was not reported on subsistence permits (E. Berekoff, Unalaska Advisory Committee, personal communication). Many local residents commented on this problem to the author while he was stationed at Unalaska in 1995 and 1996. In 1997, there was increased enforcement by ADF&G personnel checking permits in the field and by the local Fish and Wildlife Enforcement officer (prior to being temporarily reassigned to Bristol Bay near the peak of the local runs).

Another problem for Unalaska Lake sockeye salmon and other stocks has been the practice of leaving fishing gear unattended while it was being fished. This practice results in a reduced harvest for the fishermen as fish drop out of the net and marine mammals take fish, thus reducing the salmon escapement even more. In years when there is an unexpected low return of fish (i.e. Nateekin coho salmon this season) this fishing method may have substantial impacts on the spawning stocks. With the concurrence of the local advisory committee a requirement that fishermen must be in attendance of their nets was implemented as a subsistence permit stipulation. This stipulation also increased escapements by indirectly decreasing the fishing effort when persons could no longer leave their nets unattended while they were employed at other endeavors.

In order to increase the salmon escapements in Unalaska Bay (particularly Unalaska Lake sockeye salmon) while still allowing for a subsistence fishery, these issues and a range of management options were discussed with the local Fish and Game Advisory committee. While total closure or even a two day closure of the Unalaska Lake sockeye fishery could bring a more immediate increase in escapement other means to improve escapement were chosen. These options were chosen to balance a gradual rebuilding of the stock with the subsistence needs of Unalaska residents who could not participate in other fisheries. An agreement developed to implement actions in a slow step wise approach that would provide for increasing protection of local salmon stocks while implementing minimal restrictions of local subsistence fishing. ADF&G staff presented the possibility that if escapements did not improve that increasing restrictive methods would be implemented by emergency order

The following changes were implemented by emergency order and subsistence permit stipulations for the spring of 1997: 1) Subsistence fishermen in Unalaska Bay were required to be in attendance of their nets while they were being fished. 2) Closed water markers for the south side of the outlet to Unalaska Lake were moved to a point south of Agnes Beach at 53°52.28' N. lat., 166° 32.68'W. long. to a point at 53°52.35' N. lat., 166°32.95'W. long on Amaknak Island. 3) Closed waters were established at 250 yards of the stream outlets, all fresh waters and lakes of all anadromous streams in Unalaska Bay (except for Unalaska Lake where the southern makers were moved approximately 250 yards south). Systems on the road system (except for Unalaska) were reduced from 500 to 250 yards to redistribute fishing effort from Unalaska Lake stocks and to simplify the closed water closures for Unalaska Bay. 4) Permit holders were required to have their permits in their possession at all times when fishing and transporting fish (permit stipulation reinforcing existing state-wide regulations). 5) Permit holders must also record their catch immediately upon landing (permit stipulation). The local Fish and Wildlife Protection Division staff was committed to providing enforcement efforts in monitoring the subsistence fishery. Unfortunately the local officer was assigned to Bristol Bay near the peak of the subsistence fishery and most of the enforcement at that time was conducted by two local ADF&G biologists. 6) Also discussed but not implemented was a) The potential to close the Unalaska Lake subsistence sockeye fishery two days per week, one of those days being on the weekend. b) Increased closed waters at the outlet to McLees Lake during May and June.

These changes in subsistence management are intended to improve salmon escapements and to increase subsistence harvest over the long run by rebuilding the spawning stocks. In the short term, closed waters at the stream mouths may reduce the rate of the subsistence harvest but

should not affect total catch. An indirect effect might be an increase in fish available for sport fish harvest in Nateekin and Makushin Valley (Broad Bay) Rivers; while reduced closed waters at Summers Bay, Humpie Cove, and Morse Cove might increase opportunities for subsistence fishermen.

Sockeye are very easy to catch at the outlet of McLee's Lake. Some of the local subsistence gillnetters and one subsistence beach seiner "round haul" the fish that school at the mouth, at times closing the fish off from the stream. Most of the season the system is open to subsistence fishing to the stream mouth, (except July 1-9, when a 500 yard closure essentially stops the fishery because of the surf that starts about 200 yards from the stream mouth). ADF&G staff was concerned that salmon returning to Mclees Lake might not being able to enter the inlet stream except on a high tide making them potentially vulnerable to overharvest. Fish hold in the fresh water interface in the ocean near the stream mouth as they adjust to fresh water prior to entering the stream. While the escapement has not declined, department limnology data indicates this system has the potential of supporting a much larger run of 22,000 sockeye salmon (Honnold et. al, 1996). This was the first year that the escapement was recorded to exceed 10,000 fish. A hundred yard closure at the outlet was proposed as a management option. The local Advisory Committee disagreed, believing that there was not a resource problem at McLee's Lake and that they need to be able to fish at the mouth in order to catch fish efficiently. They requested that the department implement a weir project to accurately evaluate escapement and the need to have closed waters at the mouth of the outlet stream. The additional closed water option was not applied this season because of the committee's objections.

The current closed waters stipulations for the outlet of Mclee's Lake were not changed for 1997 because of the department's and local advisory committee's comments and the desire to transfer subsistence fishing effort from Unalaska Lake to McLee's Lake (which has a stronger sockeye run) and because there was inadequate information to implement a change at that time. This goal was achieved, 98% of the total Islands sockeye salmon harvest were Mclee's Lake fish, and the lake had a record escapement of 11,000 fish. This system is unique in that it is exposed to the open ocean (except for a small island) and the onshore swell and winds can often make it impossible to fish in the Bay. Summer storms can often prevent fishing for up to a week at a time.

1998 OUTLOOK

The 1998 Unalaska and Atka Islands commercial pink salmon catch and escapements should follow the pattern of stronger even year returns to most systems, unless unforeseen factors affect the number of returning salmon. There have been sizable returns from smaller escapements from the less than average parent year escapements of 1996. It is possible that Unalaska Island streams could support a moderate run of pink salmon. A commercial harvest of up to 500,000 or more pink salmon might occur at Unalaska Island with good marine survival. Another factor will be the presence of tenders from Akutan or the Alaska Peninsula or potential of a floating processor operating in the area. Most of the production would be expected to come from Makushin Bay and to a smaller extent Unalaska Bay. Potentially 10,000 or more salmon could

be taken at Atka Island. Nazan and Korovin Bays would be the major production areas for that island.

The pink harvest throughout the Aleutians will be market driven. There are no expected local markets for salmon at Unalaska Island or Atka. The only exception might be a few landings of pink salmon taken for bait.

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game). 1995a. 1995-1996 Alaska Peninsula, Atka/Amlia Islands, and Aleutian Islands Commercial Fishing Regulations Salmon and Miscellaneous Finfish, 1995 edition. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- ADF&G (Alaska Department of Fish and Game). 1995b. 1995-1996 Statewide Subsistence and Personal use regulations, 1995 edition. Alaska Department of Fish and Game, Juneau. Alaska.
- Holmes, P.B. 1997a. Aleutian Islands salmon, 1982 stock assessment survey and current status. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K97-6, Kodiak Division of Commercial Fisheries, Kodiak.
- Holmes, P.B. 1997b. Aleutian Islands and Atka-Amlia Islands Management Areas annual salmon management report, 1996. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K97-38, Kodiak
- Holmes, P.B. 1995. Atka/Amlia Islands Management Area Pink Salmon Fishery, 1992, 1993, 1994. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K95-9, Kodiak.
- Honnold, S.G., J.A. Edmundson, and S. Schrof 1996. Limnological and Fishery assessment of 23 Alaska Peninsula and Aleutian Area Lakes, 1993-1995: an evaluation of potential sockeye and coho salmon production. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K96-52, Kodiak.
- Palmer, D.E. 1995. Survey of fisheries resources on Adak Island, Alaska Maritime National Wildlife Refuge, 1993 and 1994. U.S. Fish and Wildlife Service, Technical Report Number 29, Kenai.
- Seimenstad, C.A., J.S. Isakson, and R.E. Nakatani 1977. Marine fish communities. in M.L. Merritt and R.G. Fuller eds. The environment of Amchitka Island, Alaska. United States Energy Research and Development Administration, Technical Information Document 26712, Oak Ridge.
- Shaul, A.R., and R.S. Berceli. 1994.. Aleutians Area Annual Salmon Management Report. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, Regional Information Report 4K95- 16, Kodiak..

LITERATURE CITED (Cont.)

- Valdez, R.T., W.T. Helm, and J.M. Neuhold, 1977. Aquatic ecology *in* M.L. Merritt and R.G. Fuller eds. The environment of Amchitka Island, Alaska. United States Energy Research and Development Administration, Technical Information Document 26712, Oak Ridge.
- Veltre, D.W, and M.J., 1982. Resource Utilization in Unalaska, Aleutian Islands, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper N. 58. Juneau.
- Veltre, D.W, and M.J., 1983. Resource Utilization in Atka, Aleutian Islands, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper N. 58. Juneau.

Table 1. Aleutian Islands Area (excluding Atka and Amlia Islands) commercial salmon catches (in numbers of fish), 1911-1997.

Year	Permits	Landings	Chinook	Sockeye	Coho	Pink	Chum	Total
1911			0	9,300	0	0	0	9,300
1912-15			0	0	0	0	0	0
1916			0	76,500	1,200	180,300	100	258,100
1917			0	70,400	3,800	600	23,100	97,900
1918			0	55,200	4,400	75,600	135,200	270,400
1919			0	3,900	800	4,000	0	8,700
1920			0	10,100	2,800	0	0	12,900
1921			0	0	0	0	0	0
1922			0	14,000	0	0	0	14,000
1923			0	0	0	0	0	0
1924			0	24,900	0	673,800	100	698,800
1925			0	18,600	0	3,800	9,100	31,500
1926			0	1,300	0	521,700	7,800	530,800
1927			0	17,300	0	334,600	0	351,900
1928-50								
1951			0	11,700	400	500	94,500	107,100
1952			200	42,800	0	31,800	25,700	100,500
1953			0	4,200	500	69,200	800	74,700
1954			0	6,300	800	566,500	200	573,800
1955			0	12,600	100	31,100	400	44,200
1956			0	400	0	33,900	0	34,300
1957			2,300	27,300	100	500	13,900	44,100
1958			0	300	0	613,200	3,700	617,200
1959			0	6,100	0	12,000	100	18,200
1960			0	7,600	0	444,900	300	452,800
1961			0	2,700	0	94,000	200	96,900
1962			0	5,500	100	2,001,700	1,200	2,008,500
1963			0	4,500	0	93,900	300	98,700
1964			0	200	0	194,100	2,300	196,600
1965			0	0	0	0	0	0
1966			0	1,000	0	63,500	700	65,200
1967			0	200	0	7,900	0	8,100
1968			0	2,000	100	902,800	800	905,700
1969			0	1,900	0	242,200	1,500	245,600
1970	45	361	6	208	135	644,121	3,029	647,499
1971	11	105	0	333	2	45,141	58	45,507
1972	8	28	0	69	1	2,784	6	2,860
1973	3	6	0	0	0	2,042	0	2,042
1974	0	0	0	0	0	0	0	0
1975	5	6	0	19,402	0	659	1,881	21,942
1976-77	0	0	0	0	0	0	0	0
1978	6	32	0	1,829	0	38,109	6	39,944
1979	10	124	0	12,206	0	539,393	242	551,841

-Continued-

Table 1. (page 2 of 2)

Year	Permits	Landings	Chinook	Sockeye	Coho	Pink	Chum	Total
1980	28	263	2	9,226	0	2,597,502	4,874	2,611,565
1981	16	85	16	5,430	188	302,786	6,553	314,973
1982	15	164	0	2,672	28	1,447,818	6,148	1,456,666
1983	2	11	0	4,405	0	2,005	11,361	17,771
1984	37	281	26	67,163	1,923	2,309,665	33,025	2,410,802
1985	3	4	40	2,750	0	90	14,175	17,055
1986	9	31	11	7,702	60	42,621	38,819	89,213
1987	1	1	0	75	0	0	0	75
1988	3	31	0	4,315	7	183,109	450	187,881
1989	2	6	0	8,248	0	6,700	0	14,948
1990	15	49	0	12,435	74	282,823	1,038	296,372
1991	1	2	0	796	0	0	0	796
1992	4	20	0	3,082	0	312,072	1,230	316,348
1993	0	0	0	0	0	0	0	0
1994	10	64	47	6	0	858,787	617	859,457
1995	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
Average								
1987-1996	4	17	5	2,896	8	16,435	334	167,588
Even Year Average Pink Catch, 1984-1994						664,846		
Odd Year Average Pink Catch, 1985-1995						1,132		

Table 2. Atka-Amlia Islands Area commercial salmon catches (in numbers of fish), 1992-1997.

Year	Permits	Landings	Chinook	Sockeye	Coho	Pink	Chum	Total
1992 ^a	13	41	0	231	42	7,972	308	8,553
1993 ^b	9	10	0	24	4	145	563	736
1994 ^{b,c}	6	7	0	16	0	896	0	912
1995 ^{b,c}	8	0	0	0	0	0	0	0
1996 ^{b,c}	10	0	0	0	0	0	0	0
1997 ^c	7	0	0	0	0	0	0	0
Average	9	10	0	45	8	1,502	145	1,700

^a Fisherman were never paid for their catch by processor.

^b No local market for salmon, catch retained for personal halibut bait and subsistence.

^c Small salmon return, no market, fishermen fished for halibut.

Table 3. Emergency orders for Aleutian Islands Area, 1997.

EMERGENCY ORDER NO. 4-FS-A1-01-97

EFFECTIVE DATE: May 15, 1997

EXPLANATION: This emergency order expands the closed waters for subsistence salmon fishing for the Iliulik River at the City of Unalaska. The southern closed waters boundary will be moved south from the existing boundary at the Unalaska-Amaknak Island Bridge to a line approximately 300 yards south of the bridge. The northern closed waters boundary is moved from the Russian church to the Bishop's House.

This emergency order establishes closed waters for subsistence salmon fishing in all Unalaska Bay streams, except Iliulik River as mentioned above, to include all fresh waters (lake and stream) and all marine waters within 250 yards of an anadromous stream.

JUSTIFICATION: Unalaska Lake has not reached the low end of its sockeye salmon escapement goal since 1987. Escapements in the past two years have been approximately 250 fish, well below the goal of 400 to 800 sockeye salmon. There has been virtually no commercial fishing targeting Unalaska sockeye during the past 30 years, and during many years there is no commercial effort in Unalaska Bay. The sport fish harvest on Iliulik River sockeye salmon is believed to be very minimal or nonexistent. The sport fish daily bag limit of sockeye and coho salmon in Unalaska Bay has been reduced from five to two and much of the Iliulik River is closed to fishing. The reported subsistence sockeye salmon harvest in the vicinity the City of Unalaska has averaged 260 fish during 1994 through 1996, of which over 60% was taken in the vicinity of the Unalaska-Amaknak Bridge; however the subsistence harvest is believed to be under reported. The southern boundary marker is moved south to provide a larger closed water area to conserve salmon for escapements. The northern marker is moved from the church to the light pole near the Bishop's house to alleviate placing a marker near the church.

A substantial number of coho salmon are also harvested in the subsistence fishery near the bridge and while escapement data is lacking, the Unalaska Lake coho run is not believed to be large. The subsistence salmon fishing effort has steadily increased from 89 permits issued in 1992 to 189 permits in 1996.

Presently, there are no waters closed to subsistence salmon fishing in most Unalaska Bay streams and there is concern for the health of coho stocks. Expanded closed waters will help rebuild Unalaska Lake sockeye stocks and protect coho salmon stocks through out Unalaska Bay.

EMERGENCY ORDER NO. 4-FS-M-CB-01-97

EFFECTIVE DATE: May 19, 1997

EXPLANATION: This emergency order expands the closed waters for commercial salmon fishing for the Iliulik River at the City of Unalaska. The southern closed waters boundary will be moved south from the existing boundary at the Unalaska-Amaknak Island Bridge to a line approximately 300 yards south of the bridge. The northern closed waters boundary remain as described in the regulation book.

JUSTIFICATION: Unalaska Lake has not reached the low end of its sockeye salmon escapement goal since 1987. Escapements in the past two years have been approximately 250 fish, well below the goal of 400 to 800 sockeye salmon. Iliulik River coho salmon stocks are not large and are under increasing pressure from the subsistence fishery. There has been virtually no commercial fishery on these fish. Iliulik River coho and sockeye salmon stocks are not large and are under increasing pressure from the subsistence salmon fishery. To help protect Iliulik River coho stocks and rebuild the sockeye stocks, the waters closed to subsistence salmon fishing have been expanded by emergency order 4-FS-A1-01-97. This emergency order will expand the waters closed to commercial salmon fishing to match the modified southern boundary of the subsistence closure line.

Subsistence fishing has priority over commercial fishing. Commercial effort on the Iliulik River stocks has been nonexistent for most years.

Table 4. Estimated subsistence salmon harvest by gear type for the community of Atka, 1994.^{a,b}

Species	Subsistence Methods					Total
	Set Gillnet	Beach Seine	Removed From Commercial Catch	Rod and Reel	Other	
Chinook	1	0	0	11	0	12
Sockeye	242	0	0 ^c	149	40	431
Coho	303	0	0	264	0	567
Pink	715	0	200 ^d	472	0	1,387
Chum	59	0	0 ^c	28	20	107
Total	1,320	0	200	924	60	2,504

^a Twenty eight out of twenty nine households surveyed for 1994, no survey conducted since then assume similar catches in 1995 and 1996.

^b Data gathered by Lisa Scarbrough, ADF&G, Subsistence Division, and Moses Dirks, USF&WS.

^c One household removed 100 sockeye and 75 chum salmon from commercial catch at Unalaska.

^d Additional 30 pink salmon removed from the commercial catch, area unspecified.

Table 5. Estimated subsistence salmon harvest^a for Unalaska Island, 1985-1997.

Year	Permits Issued	Chinook	Sockeye	Coho	Pink	Chum	Total
UNALASKA LOCAL COMMUNITY RESIDENTS							
1985	65	0	897	208	1,293	20	2,483
1986	121	0	3,449	847	2,468	375	7,139
1987	81	0	1,097	378	1,780	151	3,406
1988	74	1	962	390	2,626	83	4,062
1989	70	2	1,064	470	1,292	36	2,864
1990	94	4	2,357	681	1,428	100	4,570
1991	89	0	1,294	666	1,075	45	3,080
1992	144	7	2,739	587	1,723	11	5,067
1993	137	17	2,831	697	587	136	4,268
1994	150	1	2,759	774	1,053	48	4,635
1995	159	23	4,446	480	784	23	5,756
1996	189	5	1,107	1,033	492	49	2,686
1997	218	8	4,192	864	440	110	5,614
1993-97 AVG.	170.6	10.8	3,067.0	769.6	671.2	73.2	4,591.8
UNALASKA-ALEUTIAN ISLANDS NON-LOCAL COMMUNITY RESIDENTS							
1985	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0
1988	3	2	4	0	1	0	7
1989	4	0	48	0	0	0	48
1990	2	0	0	0	0	0	0
1991	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0
1993	2	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	1	0	38	4	7	0	49
1996	0	0	0	0	0	0	0
1997	3	0	0	0	114	0	114
1993-97 AVG.	1.2	0	7.6	0.8	24.2	0	32.6
TOTAL UNALASKA							
1985	65	0	897	208	1,293	20	2,418
1986	121	0	3,449	847	2,468	375	7,139
1987	81	0	1,097	378	1,780	151	3,406
1988	77	3	966	390	2,627	83	4,069
1989	74	2	1,112	470	1,292	36	2,912
1990	94	4	2,357	681	1,428	100	4,570
1991	89	0	1,294	666	1,075	45	3,080
1992	144	7	2,739	587	1,723	11	5,067
1993	139	17	2,831	697	587	136	4,268
1994	150	1	2,759	774	1,053	48	4,635
1995	160	23	4,484	484	791	23	5,805
1996	189	5	1,107	1,033	492	49	2,686
1997	221	8	4,192	864	554	110	5,728
1993-97 AVG.	171.8	10.8	3,074.6	770.4	695.4	73.2	4,624.4

^a Harvest estimated from average catch from returned permits, 1997 data is preliminary, based on 60% returned permits, expanded to estimate total catch; three non-local Alaska residents did not submit their reports.

Table 6. Average subsistence salmon harvest, in number of fish, per successful permit holder, Unalaska Island, 1987-1997.

	Year											Average 1987-1996
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
Average Harvest	79	78	58	55	55	52	48	38	49	22	36	53

Table 7. Adak-Kagalaska Islands estimated personal use catch, 1988-1997.

Year	Permits Issued	Permits Returned	Percent Returned	Est. Catch					
				Chinook	Sockeye	Coho	Pink	Chum	Total
1988	43	29	67	0	503	23	150	0	676
1989	64	47	73	0	382	0	117	0	499
1990	61	29	48	0	800	47	41	0	888
1991	37	31	87	0	281	6	34	0	321
1992	52	41	79	0	572	30	4	0	606
1993	4	3	75	0	156	0	0	0	156
1994 ^a	0	0	0	0	0	0	0	0	0
1995	4	3	75	0	156	0	0	0	156
1996	6	6	100	0	91	0	0	0	91
1997 ^b	18	12	67	0	229	0	0	4	233
1988-97 ^c Average	29	20	67	0	317	11	35	0	363

^a U.S. Navy personnel reduced at Adak, personal use permits not requested.

^b Estimated catch based on 61% returns of 18 personal use permits issued.

^c Average includes 1994.

Table 8. Unalaska Island Salmon Escapements, 1997.

Stream	Date	Observer	Location	Visi- bility	Chinook	Sockeye	Species			Observer Remarks
							Coho	Pink	Chum	
McLees Lake, 302-1507	08/18/1997	George Pappas	Stream Mouth Bay	E	0	11,000	0	0	0	DISTANCE SURVEYED: EXCELLENT VISIBILITY IN STREAMS AND AT STREAM MOUTHS, POOR IN REST OF LAKE DUE TO ALGAE BLOOM. ALL FISH OBSERVED WERE IN CREEKS. ROUGHLY 6600 WERE IN EAST CREEK.
Makushin Valley, 302-4003	08/18/1997	George Pappas	Stream Mouth Bay	P				8,000		DISTANCE SURVEYED: SURVEYED STREAM TILL RAN OUT OF FISH
Nateekin River, 302-4005	08/18/1997	George Pappas	Stream Mouth Bay	E	0	0	0	28,600	0	DISTANCE SURVEYED: COUNT LOW AS SOME BENDS WERE MISSED. SURVEYED STREAM TILL RAN OUT OF FISH.
	10/08/1997	George Pappas	Stream Mouth Bay	G	-	-	576	-	-	DISTANCE SURVEYED: SURVEYED TILL RAN OUT OF FISH
Captain's Bay Stream, 302-4006	08/18/1997	George Pappas	Stream Mouth Bay	G	0	0	0	3,600	0	DISTANCE SURVEYED: SURVEYED TILL RAN OUT OF FISH
Unalaska Village, 302-4008	08/18/1997	George Pappas	Stream Mouth Bay	G	0	330	0	0	0	DISTANCE SURVEYED: SURVEYED LAKE ONLY
Summer Bay, 302-4009	08/18/1997	George Pappas	Stream Mouth Bay	E	0	800	0	0	0	DISTANCE SURVEYED: SURVEYED LAKE AND LAST 200 YDS OF SPAWNING STREAM. 600 REDS IN LAKE. SURVEY OF STREAM INCOMPLETE
	08/19/1997	George Pappas	Stream Mouth Bay	G	0	158	0	126	0	DISTANCE SURVEYED: SURVEYED INLET STREAM AT HEAD OF LAKE ONLY.
Humpy Cove(sum. Bay), 302-4010	08/18/1997	George Pappas	Stream Mouth Bay	E	0	0	0	3,800	0	DISTANCE SURVEYED: SURVEYED STREAM TILL RAN OUT OF FISH.
				G	0	0	0	12,500	0	

-Continued-

Table 8. (page 2 of 2)

Stream	Date	Observer	Location	Visi- bility	Species					Observer Remarks
					Chinook	Sockeye	Coho	Pink	Chum	
Unalaska Village, 302-4008	09/01/1997	Arnie Shaul	Stream Mouth Bay			200		12,300		DISTANCE SURVEYED: HIGH ALTITUDE, 300 P'S SPAWNING ABOVE LAKE, 12,000 BELOW 90% IN SCHOOLS.
Summer Bay, m 302-4009	08/18/1997	George Pappas	Stream Mouth Bay	E	0	800	0	0	0	DISTANCE SURVEYED: SURVEYED LAKE AND LWR 200 YDS OF SPAWNING STREAM. 600 SOCKEYES IN LAKE, SURVEY OF STREAM INCOMPLETE
	08/19/1997	George Pappas	Stream Mouth Bay	G	0	158	0	126	0	DISTANCE SURVEYED: SURVEYED INLET STREAM AT HEAD OF LAKE ONLY.
Humpy Cove (sum. Bay), 302-4010	08/18/1997		Stream Mouth Bay	E G	0 0	0 0	0 0	3,800 12,500	0 0	DISTANCE SURVEYED:
	09/01/1997		Stream Mouth Bay					3,000		DISTANCE SURVEYED:

Table 9. Unalaska Bay Section sockeye salmon escapement goals.

Section	System Stream Number	Escapement Peak	
		Point	Range
Unalaska Bay	Morris Cove 302-40.11	250	200-400
	Summers Lake 302-40.09	1,000	800-1,600
	Unalaska Lake 302-40.08	500	400-800
	Mc Lees Lake 302-15.07	5,000	4,000-8,000
Total		6,750	5,400-8,800

Table 10. Unalaska Bay Section pink salmon escapement goals.

Section	System Stream Number	Escapement			
		Odd Year		Even Year	
		Point	Range	Point	Range
Unalaska Bay	Morse Cove 302-40.11	250	300-400	1,000	800-1,600
	Humpy Cove 302-40.10	6,500	5,200-10,400	125,000	10,000-20,000
	Summers Bay 302-40.09	500	400-800	10,000	8,000-16,000
	Illiuliuk R.(Town Cr) 302-40.08	3,000	2,400-4,800	12,000	9,600-19,200
	Pyramid Cr. 302-40.07	65	50-100	250	200-400
	Shaishnikof R. (Captains Bay Cr) 302-40.05	7,500	6,000-12,000	15,000	12,000-24,000
	Nateekin R. 302-40.05	60,000	48,000-96,000	125,000	100,000-200,000
	Makushin Valley 302-40.03	20,000	16,000-32,000	35,000	28,000-56,000
	Driftwood Bay Cr. 302-15.05	500	400-800	2,500	2,000-4,000
Total		98,315	78,750-157,300	325,750	170,600-341,200

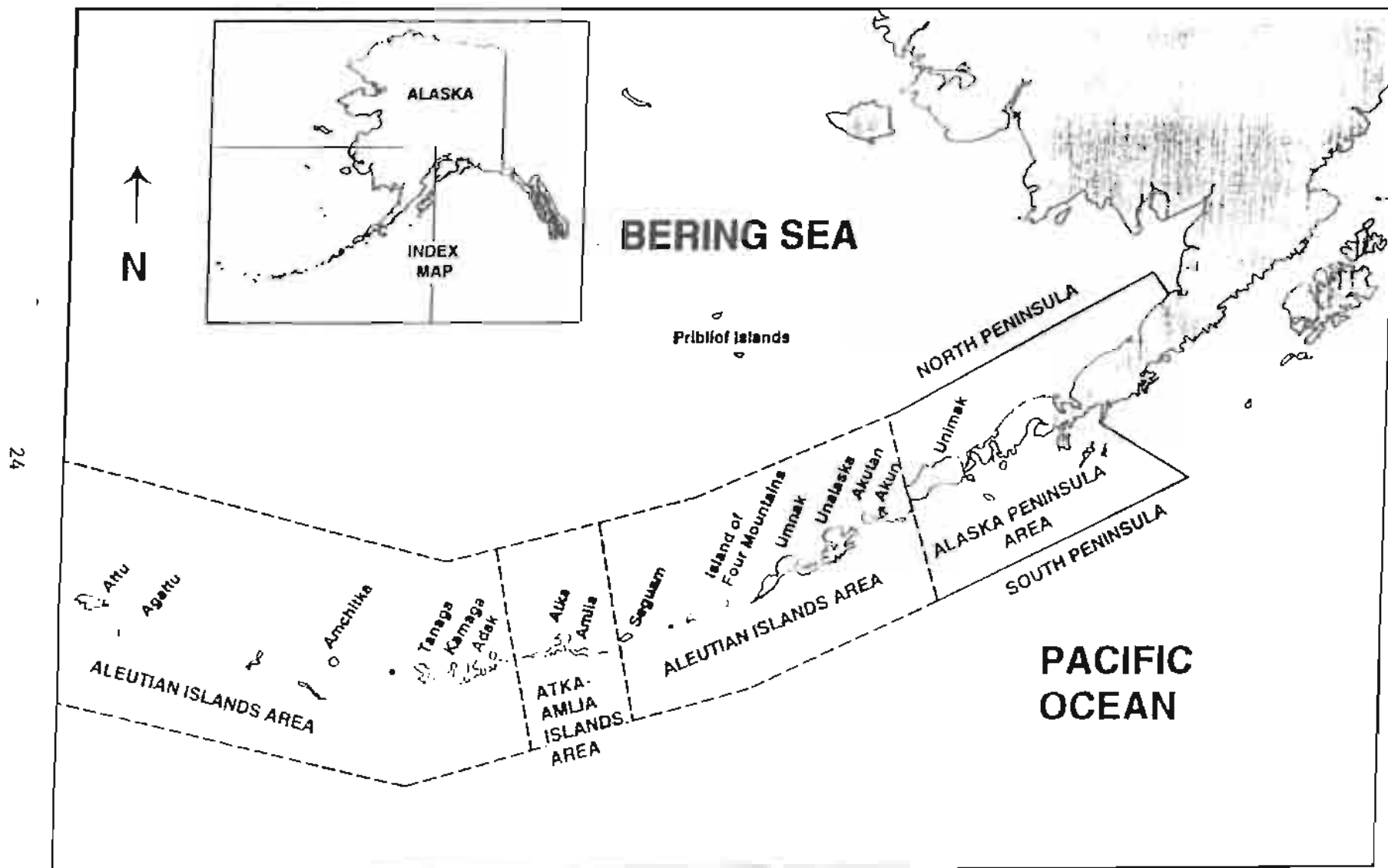


Figure 1. Map of the Aleutian Islands, Atka-Amlia Islands, and Alaska Peninsula Areas

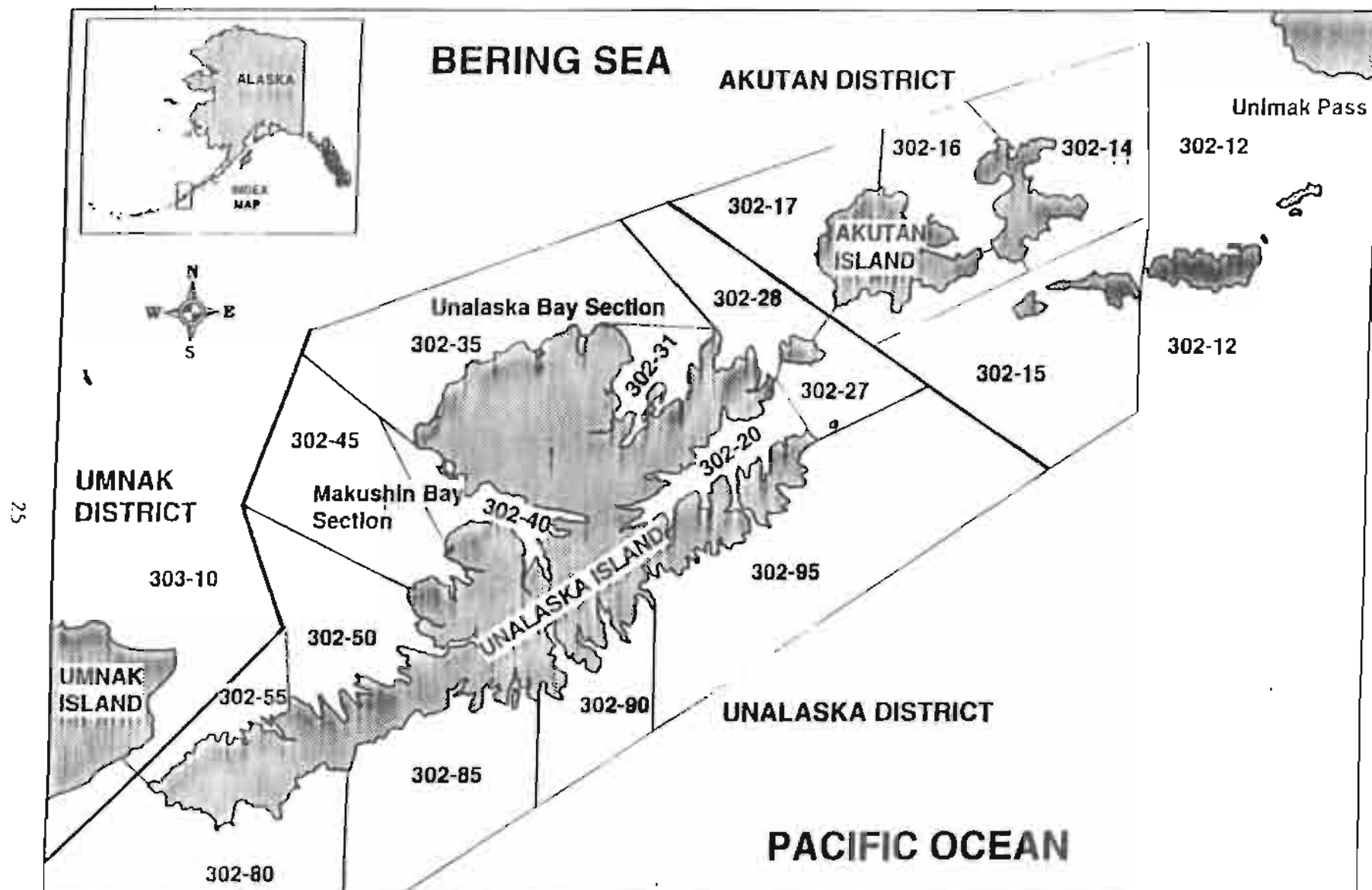


Figure 2. Map of the Aleutian Islands Management Area from Unimak Island to Umnak Island with the statistical salmon fishing areas shown.

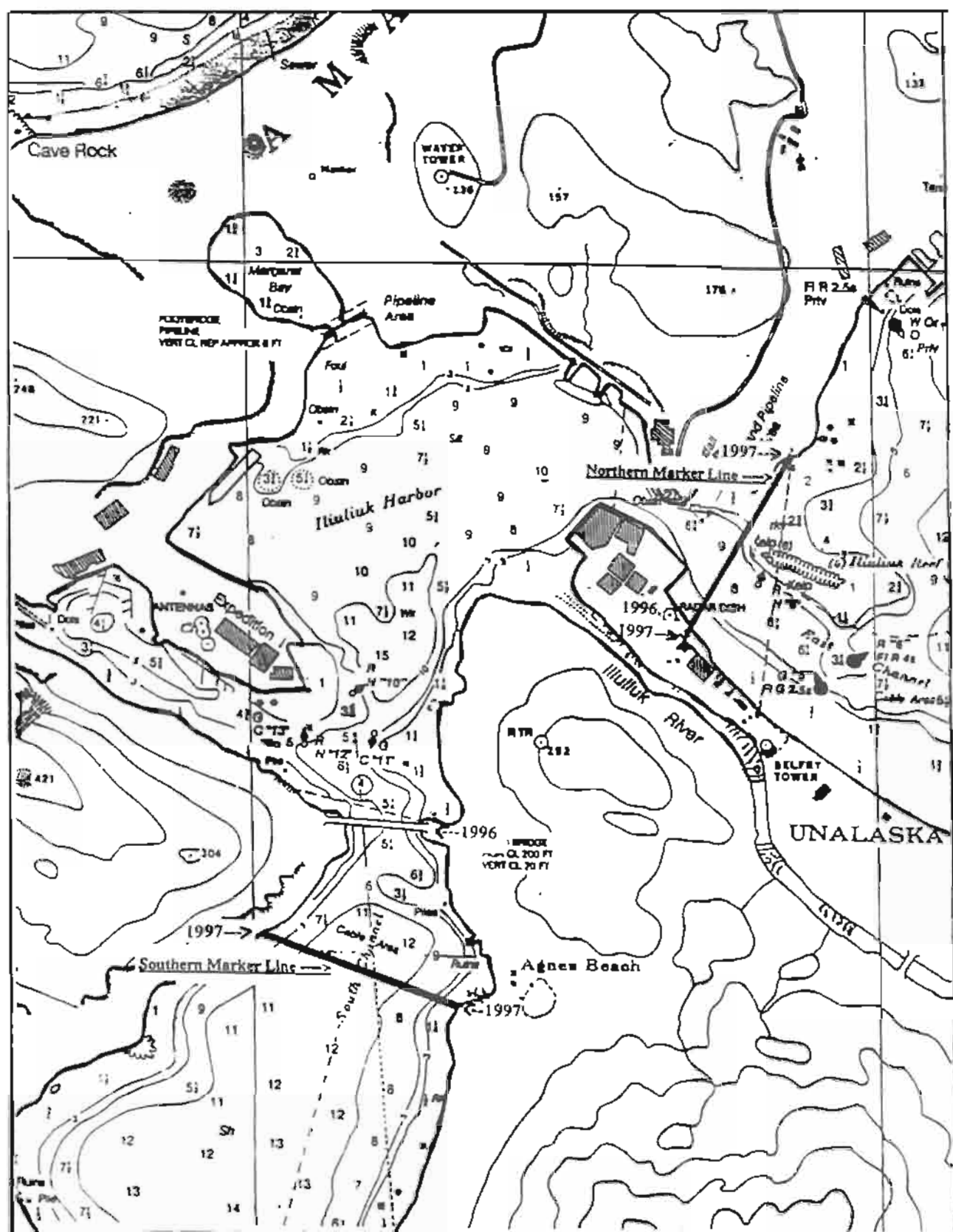


Figure 3. Unalaska Lake outlet revised subsistence salmon closed water markers.

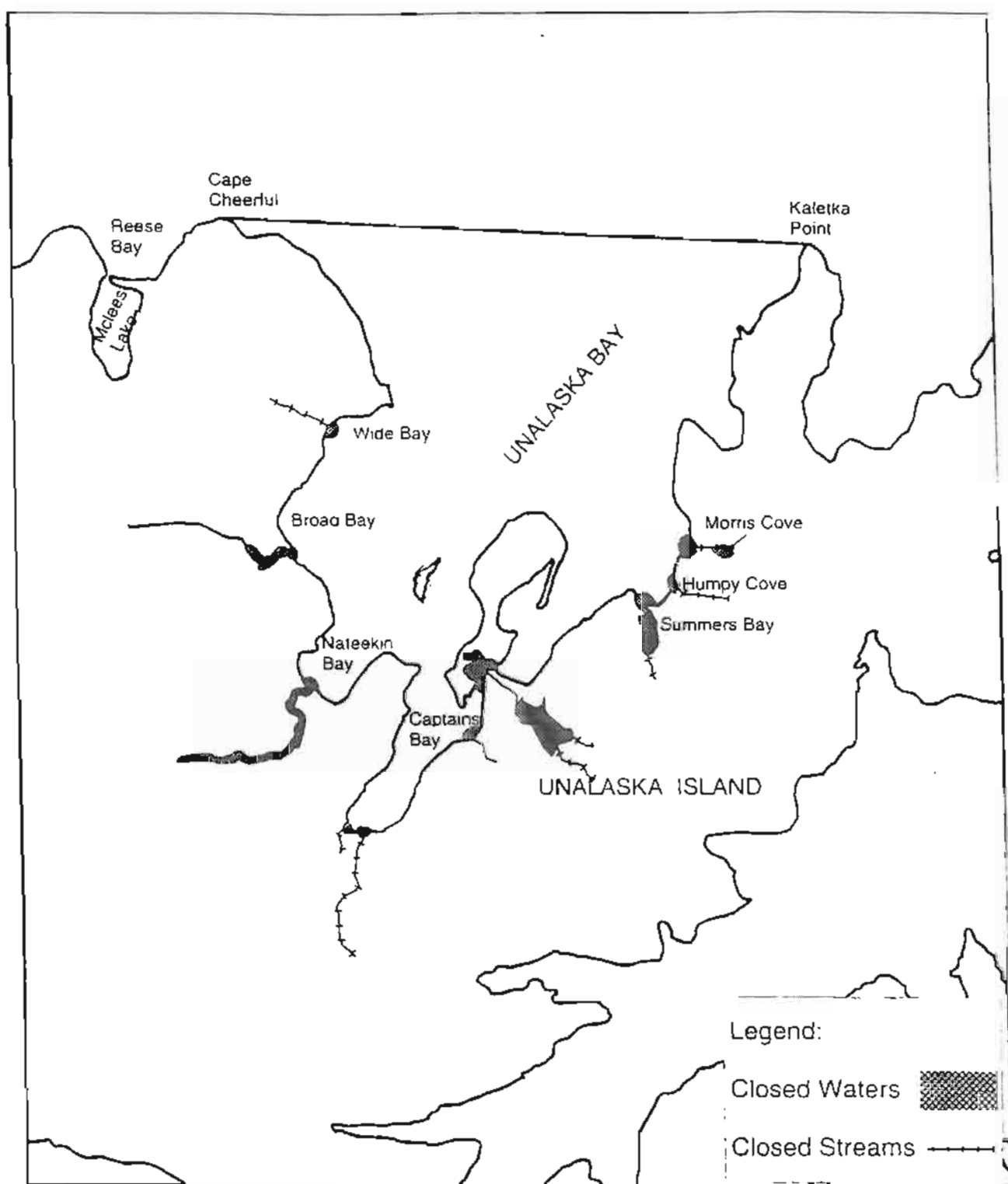


Figure 4. Unalaska Bay subsistence salmon closed waters for 1997.

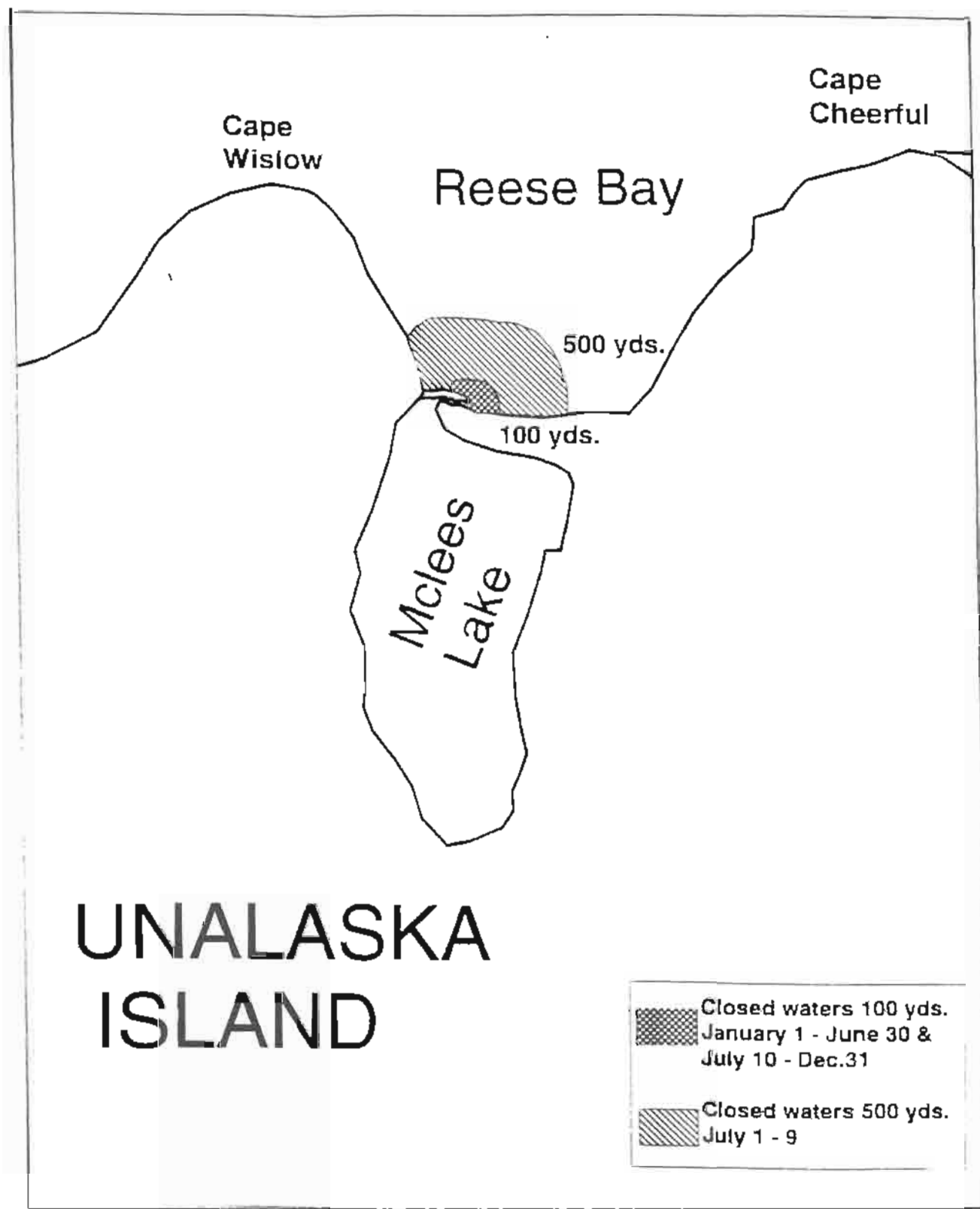


Figure 5. Proposed closed waters for the outlet of McLees Lake.

The Alaska Department of Fish and Game administers all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood, or disability. For information on alternative formats available for this and other department publications, contact the department ADA Coordinator at (voice) 907-465-4120, or (TDD) 907-465-3646. Any person who believes s/he has been discriminated against should write to: ADF&G, PO Box 25526, Juneau, AK 99802-5526; or O.E.O., U.S. Department of the Interior, Washington, DC 20240.